

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CONTOUR FARMING

(acre)
Code 330



Contour farming is most effective on slopes between 2 and 10 percent. This practice will be less effective in achieving the stated purpose(s) on slopes exceeding 10 percent and in areas with 10-year-frequency, single storm EI values greater than 140. The practice is not well suited to rolling topography having a high degree of slope irregularity because of the difficulty meeting row grade criteria. (EI = total storm energy times the maximum 30-minute intensity).

CRITERIA

General Criteria Applicable To All Purposes

All federal, state and local laws, rules and regulations will be followed

Impacts to cultural resources and Federal and State protected species shall be evaluated during planning, design and implementation of this conservation practice in accord with established National and Florida NRCS policies (General Manual, Title 420-Part 401 and Title 190-Part 410.22; National Planning Procedures Handbook, FL Supplements to Parts 600.1 and 600.5).

Minimum Row Grade. Row grades for soils with slow to very slow infiltration rates (soil hydrologic groups C or D), or for crops sensitive to ponded water conditions for periods of less than 48 hours, shall be designed with positive row drainage of not less than 0.2 percent on slopes where ponding is a concern.

Maximum Row Grade. The row grade shall be aligned as closely as possible to the contour to achieve the greatest erosion reduction. The maximum grade of rows shall

DEFINITION

Tillage, planting, and other farming operations performed on or near the contour of the field slope.

PURPOSE

The purpose of this practice is to support one or more of the following:

- To reduce sheet and rill erosion.
- To reduce transport of sediment and other water-borne contaminants.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied as a stand alone practice or a part of a conservation system.

This practice applies on sloping land where crops are grown and on recreation and wildlife areas where other cultural and management practices in a cropping system do not control soil and water loss.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

not exceed 2 percent or one half of the up and down hill slope percent used for erosion prediction, whichever is less. Up to 3 percent row grade may be permitted within 150 feet of the approach to a grassed waterway, field border or other stable outlet.

Headlands or end rows that are steeper than the maximum row grade criteria stated above shall have a cover-management condition no greater than 3 or established to permanent field borders. [Cover-Management Conditions are described in Chapter 6, Revised Universal Soil Loss Equation (RUSLE), in the Florida Agronomy Field Handbook].

When the row grade reaches the maximum allowable design grade, a new baseline shall be established up or down slope from the last contour line and used for layout of the next contour pattern. All tillage and planting operations will follow the contour line established.

Minimum Ridge Height. The ridge height shall be designed to reduce soil erosion compared to that of rows oriented up and down the slope. As a minimum, this practice shall be designed to achieve a 0.5 – 2 inch ridge height during the period of the rotation that is most vulnerable to soil erosion. Ridge height design will be determined using on site conditions and current erosion prediction technology approved for use.

The minimum ridge height criteria is not required for close-grown crops, such as small grains, when runoff is reduced compared to that of rows planted up and down the slope. As a minimum, plant height shall be at least 6 inches high and the spacing between plants within the row shall not be greater than 2 inches.

The minimum ridge height criteria is not required where the practice residue management, no-till/strip-till is used on the contour if at least 50 percent surface residue is present between the rows after planting. See Florida NRCS conservation practice standard, Residue Management, No-Till/Strip-Till, Code 329A, for further guidance.

Critical Slope Length. A contour farming layout shall not occur on a hill slope that is longer than the critical slope length, unless supported by other practices (e.g., terraces, diversions) that either reduce slope length below the critical length or reduce overland flow velocities. Increasing residue cover and roughness will change the vegetative cover-management conditions and decrease overland flow velocities. Increasing roughness alone is not sufficient to reduce the critical slope length.

The critical slope length on which contour farming is effective varies with the percent of slope, as shown in Table 1.

Table 1 – Critical Slope Length for Contour Farming

Land Slope (percent)	Critical Length ^{1/}
0 to 2	400
2 to 5	300
5 to 8	200
8 to 12	100

^{1/} Limit may be increased by 25 percent if residue cover will regularly exceed 50 percent after the crop is planted.

The computation of critical slope length shall be determined using approved erosion prediction technology.

Stable Outlets. All runoff from contouring shall be delivered to stable outlets, such as grassed waterways, field borders, water and sediment basins, or underground outlets for terraces and diversions. See Florida NRCS conservation practice standards: Grassed Waterway, Code 412, Field Borders, Code 386, Sediment Basin, Code 350, Terrace, Code 600, and Diversion, Code 362.

CONSIDERATIONS

Prior to design and layout, obstruction removal and changes in field boundaries or shape should be considered, where feasible, to improve the effectiveness of the practice and the ease of performing farming operations.

If using residue management, ridge-till on the contour, avoid crossing over ridged rows at correction areas. Consider sod turn strips if correction areas are unavoidable. See Florida NRCS conservation practice standard, Residue Management, Ridge-Till, Code 329C for further guidance.

Ridge height may vary throughout the year as a result of tillage, planting, some harvest operations, hilling, row cultivation, and weathering. Use of variable ridge height may be needed in some areas.

The width of correction areas, and the distance between baselines, should be adjusted for equipment operation widths.

Grassed waterways, water and sediment control basins, underground outlets, or other suitable practices should be used to protect areas of existing or potential concentrated flow erosion.

There are several factors that impact the effectiveness of contour farming to reduce soil erosion. These factors include: 10-year storm EI_{10} value, ridge height, furrow grade, slope steepness, soil hydrologic group, cover and roughness, and the critical slope length. Cover and roughness, row grade, and ridge height can be influenced by management and provide more or less benefit depending on design.

Contour farming may need to be used in combination with other conservation practices to meet the goals of the conservation management system.

PLANS AND SPECIFICATIONS

A. Row Crops

- Baselines will be established from which the strips will be laid out. The baselines will have a grade of one percent (1%) or less, not to exceed three percent (3%) when necessary for alignment within 100 – 150 feet of an outlet.
- The slope in the row will not exceed one-half the slope percent used for conservation planning or four percent (4%), whichever is less.
- End row areas exceeding two percent slope will either be seeded to permanent cover or intercepted by a terrace or diversion channel.
- Stable outlets will be provided for row drainage a maximum of every 700 feet. Where terraces are present, this distance may be increased to 1000 feet. Underground outlets for diversions or terrace systems and grassed waterways with established vegetative cover are acceptable outlets.
- If the slope length exceeds the guidelines under the critical slope length, then conservation practices that shorten the slope length will be installed (i.e. Terraces).
- All tillage and planting operations will parallel the baseline(s).

B. Groves, Orchards, Vineyards, or Small Fruits

In addition to the specifications under Row Crops, the following apply to Groves, Orchards, Vineyards, and Small Fruit areas.

- Tillage operations between rows of trees on hillsides will tend to form benches over time. As these benches form, they should be kept as level as possible, or be given a reverse slope towards the hill, to allow maximum infiltration and to prevent the water from flowing downhill.
- Turn strips and access roads exceeding two percent slope will be established in permanent grass vegetation.

Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan or other acceptable documentation.

OPERATION AND MAINTENANCE

Perform all tillage and planting operations parallel to contour baselines or terraces, diversions, or contour buffer strip boundaries where these practices are used, provided the applicable row grade criteria are met.



Where terraces, diversions, or contour buffer strips are not present, maintain contour markers on grades that, when followed during establishment of each crop, will maintain crop rows at designed grades. Contour markers maybe field boundaries, a crop row left untilled near or on an original contour baseline or other readily identifiable, continuous, lasting marker. All tillage and planting operations shall be parallel to the established marker. If a marker is lost, re-establish a contour baseline within the applicable criteria set forth by this standard prior to seedbed preparation for the next crop.

Farming operations should begin on the contour baselines and proceed both up and down the slope in a parallel pattern until patterns meet. Where field operations begin to converge between two non-parallel contour baselines, establish a correction area that is either permanently in sod, established to an annual close-grown crop, or is in cover-management condition 3.

Where contour row curvature becomes too sharp to keep machinery aligned with rows during field operations, establish sod turn strips on sharp ridge points or other odd areas as needed.

Renovate field borders as needed to maintain at least 65 percent ground cover. Maintain adequate field border width to allow farm implements room to turn. See Florida NRCS conservation practice standard, Field Border, Code 386.

REFERENCES

- Florida Agronomy Field Handbook, Chapter 6
- NRCS Conservation Practice Standards
 - Diversion, Code 362
 - Field Border, Code 386
 - Grassed Waterway, Code 412
 - Residue Management, Codes 329A and C
 - Sediment Basin, Code 350
 - Terrace, Code 600
-  Revised Universal Soil Loss Equation
-  eral Manual
- National Planning Procedures Handbook – FL Supplements